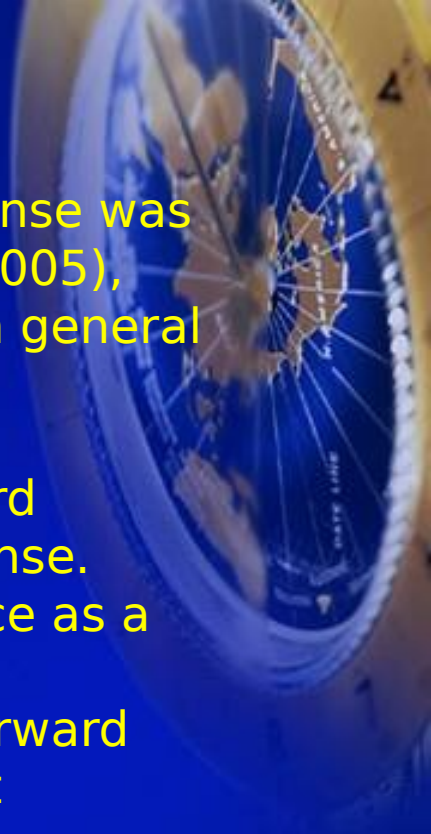
U.S. Army Corps
of Engineers
Seattle District

# Hurricane Rita, Emergency Field Office – West

# GIS Support for Historic Properties Management and Environmental Impact Analysis: Improving Future Responses



**BACKGROUND**: My experience with historic property management (HPM) support in the Hurricane Rita response was extremely limited and brief (16 October-14 November 2005), but exposure to how emergency responders used GIS in general was much more extensive.

**FOCUS**: Comments in this summary are directed toward improved use of GIS for *all* aspects of emergency response. The comments arise from my one and limited experience as a supplier of information to end-users, not as a high-level planner, and they will reflect the practical needs of a forward support office in battlefield management. They are just highlights.

**TOPICS**: **Approach, Planning, Hardware, Software, Datasets**

**ACKNOWLEDGEMENTS**: The EFO-W in the Cameron Parish Community Center was a superbly-run show, and the Blue Roof and Debris Removal teams and staff were a joy to work with. Earl Groves, Ron Hudson and Mark Harris supervised overall operations. I worked for Joel Fuchs of Tulsa District, a cadastral wizard and peerless mentor, and we were both aided, abetted and enabled by Larry Flenniken, Tulsa District IMO Chief, who helped solve some vexing networking, printing

# APPROACH

Emergency response is a battle; battle management is a spatial discipline; and GIS is the best modern battle management weapon we have. But only people make the weapon work.

**Concept**: Surroundings change fast in battle; other things being equal, victory will go to those with the best information about the field. GIS can provide that information.

**Endorsement**: If all players are behind a plan and willing to back it with their lives, the plan has the best chance of success. Players must be willing to invest in GIS.

**Team Work**: All pull together, and share what they learn about the field as fast and clearly as they can;

# PLANNING

Deployment of GIS for EM support requires better planning for logistical and organizational support. ESRI and journals have lots of information about particulars and some lessons learned from Katrina/Rita. This is my own take on things.

Planning requires a lot of improvement to meet the demands of database management and cartography. There needs to be a lot more thought put into how to organize support for the battle teams—how to update rapidly changing information about the field, verify that information, and get it to the teams so they can use it. Speed and reliability of communications are essential, no matter what the medium. When the lines were down, we used couriers to lug maps and hard drives with stored information. When electronic networks came back, we used those, at ever-greater speeds. Dynamic information—changes in road status, debris maps, access for emergency repairs etc. can be kept fresher with the e-networks,

PROVIDED THAT:

We know what we are supposed to do, when we are supposed to

# PLANNING (continued)

**Needs**:

**GIS Support Team Organization Table**, with Roles, Phone Numbers, and e-mail. Includes wizards, dealmakers and ombudsmen. Get as many terrain analysts from ANG/USAR as possible, esp. for early reponse phase.

**Network** (from couriers to T1+); includes SDE access

**Logistical Support** (GPS/Plotters/Media)

**Standards**: units, datums, grids and projections. Keep Babel in Iraq!

# PLANNING (continued)

**Gatekeepers of Reality**: These are the criticals! They assure that dynamic data really are (both).

Two components: **acquirers**—the field teams, and **keepers**—the GIS support teams.

**Acquirers**: first level—terrain analysis of instant orthophotography—for example, identify transportation kinks (blown bridges, debris blockages etc). Second level—verify terrain analysis by field checks. Create dynamic layers for current transportation network status and send data to keepers. Refresh periodically.

**Keepers**: maintain data sets from acquirers. Provide cartography to field teams and analysts. Feedback to acquirers; task acquirers for new areas. These guys should have full capability to do geocoding for address support for the field teams!

# HARDWARE PARTICULARS

**Laptops**--with standalone installations of GIS software, for when the license servers and comms are down—should have one per team at least. Most GIS support team members should have laptops in field situations. All should have full admin rights.

**Servers**--please, at least one big herky one in each support team cluster! Preferably on a local subnet, for when lines are down. For worst-case, should have peer-to-peer capability.

**Plotters**--get them in the field with adequate media supplies as fast as possible.

**GPS**--doesn't matter so much what people use, teams need lots of units. Would be best for them all to report in WGS84, decimal degrees. Please! For teams working with lots of points, should have all necessary processing software and data cables; otherwise transcription to XY tables is perfectly adequate.

**Storage**--get lots of big outboard hard drives for backup, transportation of data sets. Outboards should have fans!

# SOFTWARE PARTICULARS

PLEASE standardize versions in each theater!  All incoming PC’s need to be checked at the point of induction (PI) and problems cured.  The field needs to notify the PI of problems emerging from different loads in the field, and the PI needs to act.

Good idea to have each support team member with all necessary admin rights to install software and make most hardware changes.

# DATASETS

There should be established access (SDE preferably) to all essential dynamic data sets for each battlefield. Here are a few specifics in addition to the usual critical infrastructure etc.

**CRM/HPM**: Need pre-arranged MOU with each SHPO for EM-access to HP databases, for Blue Roof and Debris Removal programs. (Blue Roof needs programmatic exceptions for Registered Properties, BTW!)

**Wells**: Need access to actual databases, not just websites.

**Debris Disposal Sites**: Each state's DEQ list of open, closed and potential sites.

**Assessor's Parcel Data**: You gotta have it—want to get to a public site on a chenier otherwised blocked by debris on private land and surrounded by water? If you have it, the assessor has a